— add next step to PDI thru cleanup —
— this will help cover PDI now.

Denver draft

CONFIDENTIAL

TROY CONTAMINANT SCREENING STUDY

need to include PDI — we don't care when they are done



**Data Quality Objectives**

DQOs are qualitative and quantitative statements developed through the seven-step DQO process (EPA 2000b, 2000d). The DQOs clarify the study objective, define the most appropriate data to collect and the conditions under which to collect the data, and specify tolerable limits on decision errors that will be used as the basis for establishing the quantity and quality of data needed to support decision-making. The DQOs are used to develop a scientific and resource-effective design for data collection. The seven steps of the DQO process for this project are presented in Table 1.

Site background information for the Troy study area was discussed in Section X.X, and CDM has provided additional related background information for the Libby asbestos study area (CSS SAP, CDM 2003; others). Vermiculite products that contained Libby amphiboles (LA) contaminants are documented on properties and in buildings in Troy (23 properties in Troy are currently in the Libby database). The properties in Troy where sources of LA may be found are not predictable, and DEQ has concluded that each property ~~with a structure or a special-use area (flower bed, garden, or planter)~~, will be investigated and screened. Depending on the source and concentration of the LA, one or more of the three alternatives below will be applicable:

1. Remediate the interior by removing the LA vermiculite attic insulation and cleaning the levels of the structure (as appropriate based on dust sample results)
2. Remediate the special-use area and/or yard by removing the contaminated soil (as soil sample results indicate)
3. Take no further action at this time

The applicable alternatives will be selected following the criteria outlined in Section X.X of this work plan and summarized in Table X-X. These DQOs will be used to design the Troy CSS investigation and conduct the appropriate sampling and analysis to choose the correct alternative for each property.

LBAS-Troy O.U.
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X

Troy TAPE

TABLE 1

**DATA QUALITY OBJECTIVES**
**INVESTIGATION OF TROY PROPERTIES**

**STEP 1: State the Problem**

Troy, Montana, is located 18 miles from Libby, Montana. Libby is the site of a vermiculite mine and associated processing facilities that operated until 1990 and produced vermiculite insulation and other byproducts. The vermiculite deposit is contaminated with a form of amphibole asbestos (Libby amphibole). Asbestos is a known and virulent carcinogen and is associated with a multitude of respiratory health effects, including asbestosis, lung cancer, and mesothelioma.

Many mine workers lived in Troy and commuted to the mine to work because Troy is close to Libby. The mine workers were exposed to LA-contaminated materials at the mine and processing facilities, and they may have transported contaminated dust to their homes on clothes and equipment. Vermiculite is used for insulation and soil amendments, and the vermiculite and waste rock (in various forms) were used in construction and for general soil amendments in Troy. Vermiculite-containing insulation (VCI) and waste materials have been documented in Troy and may be found at other properties in Troy. Properties in Troy ~~that contain structures and special-use areas (flower beds, gardens, and planters)~~ should be investigated to determine if LA-contaminated vermiculite has been transported to these sites and at concentrations that would pose health risks to the occupants.

In 1999, EPA Region 8 dispatched an emergency response team to investigate in response to media reports that described a high rate of asbestos related deaths in Libby. Originally believed to be a problem limited to the mine workers, the scope has increased. Subsequent environmental investigations have found many areas in Libby with LA contamination. EPA began Superfund emergency response removal actions in Libby in 2000 that are ongoing through 2005. The Montana DEQ is the lead agency for the Troy site, which is an operable unit of the Libby Superfund site.

**The following are problem statements associated with the Troy Properties investigation:**

- Exposure to LA-contaminated vermiculite is a threat to human health (EPA 2001).
- Release of respirable LA asbestos occurs when source materials are disturbed (EPA 2001).
- ~~Source mat~~erials include VCI, vermiculite waste products, and soils ~~with greater than 1 percent LA~~.
- ~~Household~~ dust is a potential exposure pathway.
- LA-contaminated materials may be found randomly in Troy.
- All properties within the Troy study area ~~with a structure or yard~~ should be evaluated for the presence of LA-contaminated materials.

**TABLE 1 (continued)**

**DATA QUALITY OBJECTIVES**
**INVESTIGATION OF TROY PROPERTIES**

| **STEP 2: Identify the Decisions** |
|---|
| Principle Discussion Question: Is LA-contaminated vermiculite present on the property?<br><br>**Sampling Decisions: (Sampling decisions made based on Decision Tree)**<br>• Identify the number of potential properties to investigate by determining if the property units (parcels) could be individually bought or sold.<br>• Identify the number of properties with structures (houses) that are habitable by determining if the structures have utilities and indoor plumbing.<br>• Identify the number of special use areas on each property by determining the presence of flower beds, gardens, or planters.<br>**Cleanup Decisions:**<br>• Identify the structures with LA-contaminated vermiculite attic insulation or a secondary indoor LA source. Remediation would include removing the attic insulation and cleaning the living space.<br>• Identify the properties with special-use outside areas (flower beds, gardens, and planters) with soils that contain greater than 1 percent LA. Remediation would include removing the contaminated soil.<br>• Identify the properties where no further action is required at this time. |
| **STEP 3: Identify Inputs to the Decisions** |
| • Visually inspect properties in Troy (home and/or structure) to identify the presence or absence of VCI.<br>• Collect dust samples based on the decision tree and analyze (methods?) them to determine whether the concentration is greater than or equal t 5,000 LA structures per square centimeter (S/cm$^2$).<br>• Collect soil samples from special-use areas and analyze to determine whether the soil contains 1 percent LA or more.<br>• Visually inspect large, open areas on properties for vermiculite.<br>• Interview past and current residents to determine if they were employed at the Libby vermiculite mine or processing facilities. (Is this a sampling trigger?)<br>• Determine if current or past residents have been diagnosed with an asbestos-related disease. (privacy issues and if this is a sampling trigger) |
| **STEP 4: Define Study Boundaries** |
| • The Troy study area consists of approximately 1,091 properties, parcels, sellable units bounded by the railroad line north of the Highway 2 bridge to 5.2 miles north of First Street, the Kootenai River on the east to the junction of Highways 56 and 2, the junctions of Highways 56 and 2 on the southeast, Cox Lane along the south, and the western edge of Sections 13 and 12 T31N, R34W. Figure 1 shows the configuration of the boundary of the study area for the Troy Operable Unit.<br>• Twenty-three Troy properties are currently included in the Libby Superfund database; results of previous inspections and sampling data will be integrated with the Troy screening study data. |

**TABLE 1 (continued)**

**DATA QUALITY OBJECTIVES**
**INVESTIGATION OF TROY PROPERTIES**

| **STEP 5: Develop Decision Rules** |
|---|
| • If VCI is positively identified in an attic, then collect a dust sample in the living space to evaluate whether the concentration in the levels of the structure are greater than or equal to 5,000 LA S/cm$^2$.<br>• If the presence of VCI in an attic is not confirmed, then collect dust samples in the attic and living space to evaluate whether any secondary indoor source of LA has resulted in a concentration greater than or equal to 5,000 LA S/cm$^2$.<br>• If vermiculite is visible in special-use areas, then collect a soil sample to evaluate whether the concentration is 1 percent LA or greater.<br>• If vermiculite is visible in large, open areas of a property, then collect soil sample to determine if the concentration is 1 percent LA or greater.<br>• If no vermiculite materials are visible in large, open areas of a property and the property has no mining history, then no soil samples will be collected.<br>• If current or past residents were employed at Libby vermiculite mine, then collect dust sample from the living space to evaluate whether the concentration is greater than or equal to 5,000 LA S/cm$^2$.<br>• If current or past residents have been diagnosed with an asbestos-related disease, then collect dust sample from the living space to determine if the concentration is greater than or equal to 5,000 LA S/cm$^2$. |
| **STEP 6: Specify Tolerable Limits on Decision Errors** |
| • Sampling and measurement error are associated with environmental data collection and may lead to decision errors. Sampling error occurs when the sample is not representative of the true site conditions. Measurement error occurs because of random and systematic errors associated with sample collection, handling, preparation, analysis, data reduction, and data handling. Decision errors are controlled by adopting a scientific approach that uses hypothesis testing to minimize the potential for error.<br>• There are two types of decision error: false negative error, and false positive error. A false negative decision error occurs when the null hypothesis is rejected although it is true. The consequences of a false negative error would be that VCI or LA-contaminated dust or soil at a Troy property is not remedied. A false positive decision error occurs when the null hypothesis is not rejected although it is false. The consequences of a false positive error are that unnecessary resources are expended to undertake remedial action to address contaminated media that do not exist at concentrations that exceed action levels or acceptable risk levels.<br>• Site-specific sampling objectives and the inconsistent and unknown pattern of contaminant release over time limit the usefulness of statistical methods to eliminate sampling error. Therefore, sampling locations will be based on information from current and past residents, as available, and standard operating procedures that have been defined for the Libby Asbestos Superfund site. Tolerable limits on sampling decision errors cannot be precisely defined; however, the decision errors will be minimized by inspecting and screening all 1,091 properties in the Troy study area. Decision errors based on analytical data will be minimized by the use of EPA approved analytical methods. |

**TABLE 1 (continued)**

**DATA QUALITY OBJECTIVES**
**INVESTIGATION OF TROY PROPERTIES**

| **STEP 7: Optimize the Sampling Design** |
|---|
| • All 1,091 properties in the Troy study area will be uniquely defined in the SAP and their locations identified using existing Lincoln County records, cadastral databases, and low-level aerial photographs. The actual number of Troy properties to be investigated will be less than 1,091 because some structures and buildings likely are on multiple platted lots and properties.<br>• Soil and dust samples will be collected using similar methods as for the Libby Superfund site. With more than 4,000 Libby properties sampled since 2001, the methods have been defined.<br>• Collected and recorded samples will be transferred to EPA/Volpe, or its contractor, CDM, for preparation and analysis. Montana DEQ and its contractor, Tetra Tech, will work closely with EPA/Volpe and its contractor, CDM, to ensure that sample integrity is maintained throughout and that data quality is sufficient to meet project objectives.<br>• Sampling methods of the Troy inspection teams will be checked by analyzing splits of a small number of dust samples from each team during the first days of the sampling effort. Quick turnaround times (targeted at 24 hours) will be requested for these early sampling methodology check samples. Collection methods for dust samples may be modified based on the analytical results.<br>• An optional Troy sample coordinator, employed by CDM, may assist with the Troy soil and dust sample recording and transferring to ensure close coordination between the Troy Operable Unit and the Libby Asbestos Superfund sites. |